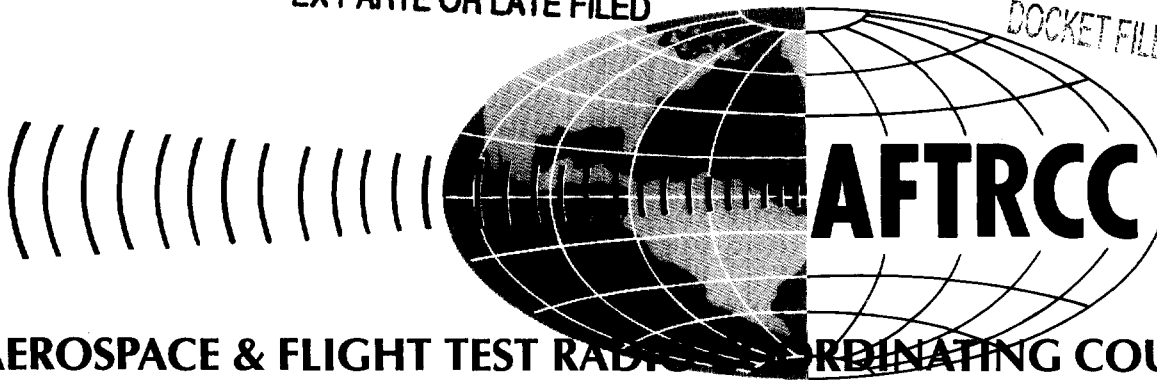


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**AEROSPACE & FLIGHT TEST RADIO COORDINATING COUNCIL**

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December 16, 1996

**RECEIVED**

**DEC 16 1996**

Federal Communications Commission  
Office of Secretary

Mr. William F. Caton  
Acting Secretary  
Federal Communications Commission  
1919 M Street, N. W.  
Washington, D. C. 20554

Re: Ex Parte Presentation /  
IB Docket No. 95-91 /  
Gen. Docket No. 90-357

Dear Mr. Caton:

Aerospace and Flight Test Radio Coordinating Council ("AFTRCC") hereby submits this ex parte statement in connection with the above-referenced proceeding.

It has come to our attention that there is an inconsistency between the treatment proposed for the band 2320-2345 MHz in the Wireless Communications Service ("WCS") proceeding (FCC 96-441, released November 12, 1996), and the treatment proposed in the Satellite DARS proceeding (FCC 95-229, released June 15, 1995).

Specifically, in the WCS docket the Commission has proposed to continue the footnoted primary status for flight test telemetry in 2320-2345 MHz provided by US 328 (namely, primary status until January 1, 1997 or until a BSS system is operational so as to affect or be affected by telemetry, whichever is later).

However, in the DARS proceeding the Commission, after endorsing footnote US 328, proposes a "consequential" change to Aviation Service Rule 87.303 so as to confine flight test S-band operations to 2360-2390 MHz effective upon adoption of a decision in that proceeding. Compare Notice of Proposed Rulemaking, FCC 95-229, para. 61 with paras. 120-21 and Appendix II. It is not entirely clear from the DARS Notice whether the Commission intends the Rule 87.303 revision to trump footnote US 328, but that would be one possible interpretation.

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Mr. William F. Caton  
December 16, 1996  
Page 2

In AFTRCC's view such a result would be unfounded. The Commission's WCS Notice would preserve telemetry's ability to operate in 2320-2345 MHz per footnote US 328. The Satellite DARS proceeding should reach a similar result. In particular the Commission should prescribe that the effective date of the proposed revision to Rule 87.303 be the date the first BSS system becomes operational.

In following this course the Commission would avoid a sudden disruption to flight test operations coincident with adoption of a decision in the DARS proceeding; rather it would facilitate a smooth transition to 2360-2390 MHz for flight test agencies. Nor is there any downside risk for satellite operators: Flight test agencies currently operating in 2310-2320 or 2345-2360 MHz will not purchase and install equipment for 2320-2345 MHz only to have to retune that same equipment for 2360-2390 MHz. Moreover, once BSS systems become operational, flight testing in the band will be effectively at an end: By virtue of the highly sensitive nature of telemetry receivers (which require protection down to a level of  $-177 \text{ dBW/m}^2/4 \text{ kHz}$ ), they cannot afford the risk of interference from BSS and will naturally avoid use of 2310-2360 MHz. In other words BSS's ability to use the band will be self-executing. Of course, the flight test community is aware of the impending need to migrate to 2360-2390 MHz, and has begun that process. All that we seek to accomplish here is a needless and sudden eviction from 2320-2345 MHz for operators who have reasonably relied upon a further period of time to effect a transition, i.e. until the first BSS system is operational.

Two copies of this letter, as well as AFTRCC's opening and reply comments in the WCS proceeding, are submitted to the Secretary for inclusion in each of the above-referenced dockets.

Respectfully submitted,



Rex D. Miller  
Chairman

Enclosures

BEFORE THE  
**Federal Communications Commission**

WASHINGTON, D.C. 20554

**STAMP & RETURN**

In the Matter of )  
 )  
Amendment of the Commission's ) GN Docket No. 96-228  
Rules to Establish Part 27, )  
the Wireless Communications )  
Service ("WCS") )

**RECEIVED**

**DEC 14 1996**

TO: The Commission

FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF SECRETARY

**COMMENTS OF**  
**AEROSPACE AND FLIGHT TEST RADIO COORDINATING COUNCIL**

Aerospace and Flight Test Radio Coordinating Council ("AFTRCC"), by its counsel, hereby submits its comments on the Notice of Proposed Rulemaking (FCC 96-441, released November 12, 1996) in the above-captioned proceeding.

**INTRODUCTION**

AFTRCC is an organization comprised of major corporations engaged in the design, development, and production of aircraft, space vehicles, and their major components. Members of AFTRCC include the principal U.S. aerospace manufacturers. Given its members' role in the development, testing and production of aircraft and space vehicles, AFTRCC serves as the FCC-recognized non-Government advisory committee for coordination of the flight test frequencies shared by non-Government and Government users.

The subject Notice seeks to implement the Congressional directive to reallocate and auction the bands 2305-2320 and 2345-2360 MHz. The band 2310-2360 MHz is currently reserved by virtue of footnote US328 for primary use by the mobile and radiolocation services until

January 1, 1997 or until broadcasting-satellite (sound) service has been brought into use in such a manner as to affect or be affected by the mobile and radiolocation services in those service areas, whichever is later....

Moreover, by virtue of footnote US 276,

... use of the band 2310-2390 MHz by the mobile service is limited to aeronautical telemetering and associated telecommand operations for flight testing of manned or unmanned aircraft, missiles or major components thereof. The following six frequencies are shared on a co-equal basis by Government and non-Government stations for telemetering and associated telecommand operations of expendable and re-usable launch vehicles whether or not such operations involve flight testing: 2312.5, 2332.5, 2352.5, 2364.5, 2370.5, and 2382.5 MHz. All other mobile telemetering uses shall be secondary to the above uses.

AFTRCC members utilize 2310-2360 MHz frequencies for their flight test operations. Hence, AFTRCC members are affected by the Notice.

## DISCUSSION

AFTRCC does not oppose the proposed reallocation. Rather, AFTRCC comments to ensure that there be no confusion as to the status of flight testing upon adoption of a report and order.

The Notice proposes that flight testing retain its footnote primary status in the band 2320-2345 MHz. See proposed revisions to footnotes US328 and US276; see also Notice, note 18. This is only as it should be inasmuch as the 2320-2345 MHz allocation would not be changed by the proposal.

AFTRCC likewise supports proposed footnote USyyy which preserves co-equal status for the two discrete expendable/re-useable launch vehicle frequencies which happen to fall within the 2305-2320 and 2345-2360 MHz bands.<sup>1</sup> These frequencies were allocated in Gen. Docket No. 89-16 in order to support the nascent

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<sup>1</sup> Proposed footnote USyyy reads:

The bands 2310-2320 and 2345-2360 MHz are also available for aeronautical telemetering and associated telecommand operations for flight testing of unmanned aircraft, missiles or major components thereof on a secondary basis to the Wireless Communications Service. The following two frequencies are shared on a co-equal basis for telemetering and associated telecommand operations of expendable and re-usable launch vehicles whether or not such operations involve flight testing: 2312.5 and 2352.5 MHz. Other mobile telemetering uses may be provided on a non-interference basis to the above uses.

U.S. commercial launch industry. 5 FCC Rcd 493 (1990). With new generations of low earth orbit mobile satellite constellations moving toward operational status, there will be a surge in demand for launch services. The specified frequencies play an important role in this regard and, thus, it is entirely appropriate that these frequencies be afforded protection.

Apart from this, however, AFTRCC has a concern with the WCS out-of-band emission limits proposed in Rule 27.53. Notice, Appendix at 14; see also Notice, para. 34. Specifically the proposed limits are expressed in terms of transmitter power factors. What this approach does not include is an allowance for antenna gain or path loss. This is an important omission from the flight test standpoint. A word or two of background may be helpful here.

Flight testing is, by its nature, a high risk enterprise. Interference-free telemetry reception is essential so that ground controllers and flight engineers are able to monitor critical aircraft parameters such as engine temperatures, stress on air-foils, and airframe vibration, to name just a few. In the event ground personnel detect an unsafe condition, they are able to warn the flight crew so that immediate corrective measures can be taken. In short telemetry provides a real-time lifeline for aircraft safety.

Interference-free telemetry is also essential to the efficient conduct of flight test programs. The typical flight test can involve scores of personnel, a wide variety of ground equipment, possibly chase aircraft, the appropriate weather conditions, and the like. Millions of dollars can be tied up in even one flight test -- not to speak of the value of the test aircraft itself which can represent an R&D investment well in excess of \$1 billion. Any delay in a flight test due to the presence of a potentially interfering signal can mean exorbitant expense. Moreover, the data generated by a test flight must be carefully analyzed to determine whether the aircraft performed as predicted. Any interruption or degradation in that data can mean loss of the flight's data and the costly need to re-fly the test.

Finally, it must be recognized that there is very limited space aboard aircraft and missiles for extra equipment. Telemetry transmitters must be small; and data must be transmitted over large distances using low signal levels. When these signals are subjected to the extreme vehicle gyrations which can occur during a flight test, the end result is a signal which starts out low and fluctuates down to a barely detectable level. It should come as no surprise, therefore, that telemetry receivers are designed to be ultra-sensitive; they require interference protection down to a level of  $-177 \text{ dBW/m}^2/4 \text{ kHz}$ . The absence of

an appropriate out-of-band emission limit for the 2320-2345 and 2360-2390 MHz bands accordingly leaves flight testing without adequate protection. AFTRCC urges that this matter be rectified in the report and order.

**CONCLUSION**

Accordingly AFTRCC urges the Commission to preserve the footnote primacy for telemetry in the band 2320-2345 MHz; supports co-equal protection for the two launch vehicle frequencies; and urges adoption of the specified protection level.

Respectfully submitted,

AEROSPACE AND FLIGHT TEST RADIO  
COORDINATING COUNCIL

A handwritten signature in cursive script, appearing to read 'William K. Keane', written over a horizontal line.

William K. Keane

Arter & Hadden  
Suite 400K  
1801 K Street, N. W.  
Washington, D. C. 20006  
(202) 775-7100

December 4, 1996

Its Counsel

**WASHINGTON, D.C. 20554**

TO: The Commission

Aerospace and Flight Test Radio Coordinating Council  
("AFTRCC") hereby replies to certain of the opening comments filed  
in the above-captioned proceeding.

In its opening comments AFTRCC supported the Commission's proposal to preserve a transitional primary position for flight testing in the band 2320-2345 MHz; but urged that the Commission re-think the proposed Wireless Communications Service ("WCS") out-of-band attenuation limits. In particular, AFTRCC observed that the proposed limits would not protect flight testing, ground receiving stations for which are extremely sensitive.

## DISCUSSION

Only a handful of the opening comments warrant a reply. In particular Consumer Electronics Manufacturers Association ("CEMA") urges the Commission not to finalize its rules for WCS until CEMA has filed its report on test results of the various DARS systems. CEMA further suggests that it may seek alternative spectrum for DARS.

It appears that CEMA would have the Commission further delay the completion of the Satellite DARS proceeding -- a proceeding that has already consumed an inordinate length of time. Moreover, there is no indication in the comments of any of the DARS applicants that the spectrum available for DARS (2320-2345 MHz with 2305-2320 and 2345-2360 MHz available on a shared basis with WCS) is inadequate. DARS has had enough problems getting off the ground without re-opening the long-settled allocations issue, least of all at the behest of a party which is not even an applicant.

One party (Primosphere Limited Partnership) calls attention to the inconsistency between the proposed protection for telemetry in footnote US 328 (a protection which would be continued for flight testing in 2320-2345 MHz by the WCS Notice) and the proposal to relegate flight testing to secondary status in

the WCS bands. The commenter also references the proposal in the DARS Notice to effect a consequential revision to Aviation Rule 87.303, a revision which would arguably confine flight testing to 2360-2390 MHz coincident with adoption of a DARS decision.<sup>1</sup> The commenter goes on to "oppose[] maintaining aeronautical telemetry allocations in the 2310-2360 MHz band even on a secondary basis." Id. at 7.

There is no basis for relegating flight testing to secondary status in 2320-2345, much less any basis for precluding flight test use of the band altogether. The aviation community agreed to reallocation of the band 2310-2360 MHz for DARS at the time of the 1992 WARC in return for preservation of the L-band from 1435-1525 MHz and the remainder of the S-band from 2360-2390 MHz. Integral to that agreement was the notion that flight testing could continue to use 2310-2360 MHz "until January 1, 1997 or until broadcasting-satellite (sound) service has been brought into use in such a manner as to affect or be affected by the

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<sup>1</sup> It should be noted that the DARS Notice is itself inconsistent on this point. DARS Notice of Proposed Rulemaking, FCC 95-229, released June 15, 1995, para. 61 (endorsing continued protection for flight testing a la' footnote US 328) with paras. 120-21 and Appendix II (suggesting "consequential" revision to Part 87).

mobile and radiolocation services in those service areas, whichever is later." US 328. This dispensation was important in order to avoid needless disruption to the flight test ranges operating in the lower S-band. Adoption of the commenter's view would eviscerate this transitional protection, and for no good reason.

The simple fact is DARS has nothing to be concerned about from flight testing: Flight test authorities will not undertake the expense of moving from 2310-2320 MHz, for example, to 2320-2345 MHz, only to have to move again (up to 2360-2390 MHz) in a year or two when BSS becomes operational. And in any event, flight testing would hardly run the risk of receiving interference from a BSS system in order to stay put in 2320-2345 MHz past the BSS operational date. Such a notion is contrary to the realities of flight testing -- a process which depends critically on interference-free, real-time telemetry for aircrew safety and productivity, but which utilizes ground receiving systems requiring protection down to a level of  $-177 \text{ dBW/m}^2/4 \text{ kHz}$ .<sup>2</sup> In

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<sup>2</sup> Airborne transmitters are often small with low output power. With aircraft operating at significant distances from the test facility and undergoing the extreme gyrations which can characterize the flight test process, telemetry signals start out low and fluctuate down to barely detectable levels; hence, the need for extremely sensitive receivers -- receivers which are also (Continued)

other words flight test agencies will continue migrating from 2310-2360 MHz for their own good reasons: There is no need to evict them from 2320-2345 MHz prematurely.<sup>3</sup>

Finally, there is the matter of out-of-band attenuation. Lucent Technologies, Inc. suggests that the out-of-band emission guidelines used for PCS should be applied provisionally to WCS. However, the PCS Rule (§ 24.238) suffers from the same deficiencies as the WCS proposal, indeed it is identical for mobile operations. AFTRCC urges that this issue be given further study so that flight testing in 2320-2345 and 2360-2390 MHz (ultimately the latter band only) is protected from out-of-band emissions from whatever source.

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sensitive to the presence of unwanted signals. In this respect AFTRCC agrees with the commenter that "spectrum sharing between DARS and aeronautical telemetry is not technically feasible...." Id. at 7.

<sup>3</sup> AFTRCC would prefer to see the protection of footnote US 328 continued for the proposed WCS bands as well, i.e. 2310-2320 and 2345-2360 MHz. Unfortunately the Omnibus Consolidated Appropriations Act, 1997, directing the Commission to reallocate and license these bands on an accelerated timetable, has effectively precluded this result.

CONCLUSION

For the reasons stated herein and in AFTRCC's opening Comments, the WCS proceeding should be resolved along the lines recommended by AFTRCC.

Respectfully submitted,

AEROSPACE AND FLIGHT TEST RADIO  
COORDINATING COUNCIL

A handwritten signature in cursive script, reading "Rex D. Miller", is written over a horizontal line.

Rex D. Miller  
Chairman

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December 16, 1996